AMENDMENTS TO THE CLAIMS

The following list of claims is intended to replace all prior versions or listings of claims in the application. Please cancel the claims marked canceled, without prejudice to refiling in a continuation or divisional, and amend the claims as follows:

1 – 9 (**Canceled**)

10.   (**Currently Amended**) A machine comprising:

a computing device for determining an implied volatility of an American option ~~that can be exercised prior to the time when the option expires~~, wherein said device is configured to:

generate a binomial tree having a plurality of nodes, each node corresponding to a different sub-period of time during which the American option can be exercised prior to the time when the option expires;

compute a value for node vega at each node of the binomial tree for the corresponding sub-period of time;

compute a value for vega for the binomial tree using a function of the values for node vega computed at the nodes; and

compute a value for the implied volatility of the American option using a function of the value of vega computed for the binomial tree.

11. (**Currently Amended**) The machine of Claim 10, wherein the <u>computing device computes the</u> value for node vega at each node is the exact derivative of the option price with respect to the volatility when the option is not exercised at the sub-period of time corresponding to the node.

12. (**Currently Amended**) The machine of Claim 10, wherein the <u>computing device computes the</u> value for node vega at ~~each~~ <u>a</u> node ~~is~~ <u>as a function of</u> the security price of the option when the option is exercised at a sub-period of time corresponding to the node.

13.   (**Currently Amended**) The machine of Claim 12, wherein the ~~security is an index~~ computing device computes the value for node vega at each node as a function of the index price of the option when the option is exercised at a sub-period of time corresponding to the node.

14. (**Currently Amended**) The machine of Claim 10, wherein said computing device is configured to calculate the implied volatility of the American option ~~reiteratively~~ using new values for node vega in each iteration until the computed price of the American option converges to the market price of the American option.

15. (**Currently Amended**) The machine of Claim 14, wherein said computing device is configured to calculate the new values for ~~node vega~~ implied volatility in each iteration using the Newton-Raphson method.

16.   (**Previously Presented**) The machine of Claim 10, wherein said computing device is configured to calculate the price of the option at each node at the same time as the computing device calculates node vega at the node.

17.   (**Currently Amended**) A method for determining an implied volatility of an American option ~~that can be exercised prior to the time when the option expires~~, wherein said method comprises:

generating a binomial tree having a plurality of nodes, each node corresponding to a different sub-period of time during which the American option can be exercised prior to the time when the option expires;

computing a value for node vega at each node of the binomial tree for the corresponding sub-period of time;

computing a value for vega for the binomial tree using a function of the values for node vega computed at the nodes; and

computing a value for the implied volatility of the American option using a function of the value of vega computed for the binomial tree

wherein each of the computing steps is performed by a computing device.

18. (**Currently Amended**) The method of Claim 17, wherein the value for node vega at each node is <u>calculated as the</u> exact derivative of the option price with respect to the volatility when the option is not exercised at the sub-period of time corresponding to the node.

19. (**Currently Amended**) The method of Claim 17, wherein the value for node vega at each node is <u>calculated as a function of the</u> security price of the option when the option is exercised at a sub-period of time corresponding to the node.

20. (**Currently Amended**) The method of Claim 19, wherein the ~~security is an index~~ <u>the value for node vega at each node is calculated as a function of the index price of the option when the option is exercised at a sub-period of time corresponding to the node</u>.

21. (**Currently Amended**) The method of Claim 17, wherein computing the value of the implied volatility of the American option comprises calculating node vega ~~re~~iteratively using new values for each iteration until the computed price of the American option converges to the market price of the American option.

22. (**Currently Amended**) The method of Claim 21, wherein calculating the new values for ~~node vega~~ <u>implied volatility</u> in each iteration comprises using the Newton-Raphson method.

23. (**Previously Presented**) The method of Claim 17, wherein node vega and the price of the option are calculated at the same time for each node.

24. (**Previously Presented**) The machine of claim 10, wherein said machine is configured to compute a value for vega for the binomial tree using a recursive function of the values for node vega computed at the nodes.

25. (**Previously Presented**) The method of claim 17, wherein said computing of a value for vega for the binomial tree is conducted using a recursive function of the values for node vega computed at the nodes.

26. (**New**) The machine of Claim 10, wherein said computing device computes a value for the option price at each node and the node vega for the corresponding sub-period of time is computed using the option price of a node corresponding to a subsequent period of time.

27. (**New**) The method of Claim 17, comprising the step of computing a value for the option price at each node and wherein the value for the node vega for a sub-period of time is computed using the option price of a node corresponding to a subsequent period of time.

28. (**New**) A machine comprising:

a computing device for determining implied volatility of an American option, wherein said device is configured to:

iteratively generate a new tree for each new value of volatility, the tree having a plurality of nodes, each node corresponding to a different sub-period of time during which the American option can be exercised prior to the time when the option expires;

calculate a value of vega for each tree using values of the option price calculated at nodes of a single tree; and,

calculate the implied volatility of the option using a function of the values calculated for vega for the trees.